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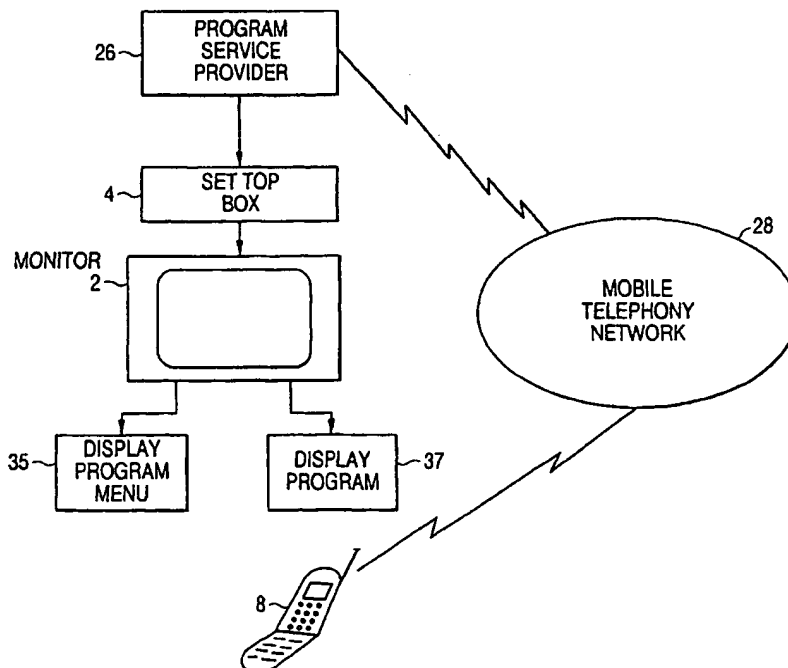
(43) International Publication Date
25 May 2001 (25.05.2001)

PCT

(10) International Publication Number
WO 01/37567 A1

- (51) International Patent Classification⁷: **H04N 7/173, 5/445**
- (21) International Application Number: **PCT/IB00/01694**
- (22) International Filing Date:
16 November 2000 (16.11.2000)
- (25) Filing Language: **English**
- (26) Publication Language: **English**
- (30) Priority Data:
09/442,093 17 November 1999 (17.11.1999) **US**
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- (81) Designated States (*national*): **AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW.**
- (84) Designated States (*regional*): **ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).**
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- Published:
— *With international search report.*
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

(54) Title: **METHOD TO ORDER TV SERVICES WITH A CELLULAR TELEPHONE**



(57) Abstract: A method and system for ordering programming displayed on a TV monitor using a cellular telephone to order programming from a service provider.

METHOD TO ORDER TV SERVICES WITH A CELLULAR TELEPHONE

TECHNICAL FIELD

The invention pertains to using cellular telephony to select multimedia service provided through terminals, typically TV. The selection of programming is performed using a wireless messaging device including a cellular or equivalent telecommunication device.

DEFINITIONS:

ADTVEF	Advanced Television Enhancement Forum
API	Applications Programming Interface
BT	Bluetooth, Low Power RF Link
CA	Communication Assistant
CPU	Central Processing Unit
CT	Cordless Telecommunications
DVB	Digital Video Broadcasting
GPRS	General Packet Radio Service
GSM	Global System for Mobile Communications
I/O	Input and Output
LPRF	Low Power Radio Frequency
MPEG	Moving Picture Experts Group
NVoD	Near Video on Demand
POTS	Plain Old Telephone System
RC	Remote Control
SC	Smart Card
SM	Short Message
SMSC	Short Message Service Center

COPIE DE CONFIRMATION

STB	Set Top Box
SW	Software
TV	Television
VoD	Video on Demand
WAP	Wireless Application Protocol

BACKGROUND OF THE INVENTION

At present when a viewer selects programming over his home television he places the order over a hard wire telephone line. This necessitates a connection of a set top box (STP) through a modem to a telephone jack to connect to a service provider to place a viewing selection as well as a separate connection to an antenna for the programming signal. In the instance where the STB already has been installed to the viewing terminal, the initiation of a dial up multimedia ordering service requires the connection to a hard-wired telephone line, which is usually a two pair line. In some instances it is an ISDN service. IN each instance the service provider has a set of servers accessed by a modems to receive the viewers programming selection.

Recently announced is a future programming selection service over the Internet to be offered by AOL ® and TiVo Inc. of Sunnyvale, Calif. The service will allow accessing the Internet via a set top box to find and record programs. It too requires connection via a modem using a hard wire to connect to a telephone jack to place programming selection via the Internet. The proposed service is reported to provide enhanced television programming with Internet access, instant electronic messaging and other interactive services as yet to be defined. The announced availability date is sometime next year according to an article in the August 18, 1999 San Jose Mercury News, page C.1.

In each of these applications the set top box is hard-wired to a telephone line usually through a modem to communicate the viewers program selection. In addition, older systems

allowed the viewer to call a telephone number and order programming over a conventional telephone line. They both have a physical limitation of dual connection to a telephone hardwired line and an antenna outlet.

OBJECTS OF THE INVENTION:

An object of the invention is to provide cellular access to order programming for TV viewing.

Another object of the invention is to provide cellular access to programming for TV viewing thereby eliminating the need for a modem in a Set Top Box (STB) to access a service provider to order programming.

Yet another object is to create a system and method to easily verify a customer ordering a programming service.

Another objective is to make a simpler and less expensive STB by using cellular access to order programming thereby eliminating the need for a modem in a STB to access a service provider over hardwired telephone lines.

Still yet another object of the invention is to avoid the need for hardwired telephone lines as a means of access to a service provider to order programming.

Another object of the invention is to eliminate the need for modems at servers to receive customer orders for programming service.

And another object is to provide mobile access to order programming service from a service provider by using a cellular system to allow delivery of programming to mobile monitors such as TVs.

SUMMARY OF THE INVENTION

The invention is a method and system to order programming over a Set Top Box (STB) used in conjunction with a TV by a mobile telephone over a mobile communications network including a cellular network. The signal used to order service may be a Short

Message (SM) or a data pack created by a Wireless Application Protocol (WAP). A short message service center (SMSC) may carry the received message to a service provider. The customer is identified referencing the cellular customer database. This data can also be used for billing and to authenticate the customer. Billing is handled via the Service Provider responsible for billing of the TV services.

Alternatively, a service provider is contacted over a mobile communications network to order programming and to communicate billing information and to authenticate the customer by a cellular calling device communicating with LPRF link associated with a STB. The service is used with a remote controller (RC) connected to a STB.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 illustrates a system for ordering TV-Services with a cellular telephone.

FIG. 1-A illustrates a multimedia terminal without a telephone modem.

FIG. 2 illustrates a multimedia terminal.

FIG. 3 illustrates a system for ordering TV-Services with a cellular telephone using a cellular telephone to access a mobile telephone network to order programming.

FIG. 4 illustrates a system for ordering TV-Services in which a cellular telephone unit operates directly with a STB in response to signals from a RC to connect to a service provider to select programming.

FIG. 5 illustrates in a table the linking together of TV based services and cellular based customers.

DETAILED DESCRIPTION OF THE INVENTION

Referring to Figure 1, interactive television now allows a viewer to select programming from a menu provided on a TV 2 screen. Existing systems routes the programming signal through a STB 4 and thence to the TV 2 for display on its monitor. The STB 4 is connected electronically through a modem over a hardwire telephone line to a

programming provider as described in Figure 1. The STB 4 is a multimedia terminal known in the art and further described in Figure 1. Programming selections are made using Remote Control (RC) 6. The STB 4 is connected to a programming provider through a hardwired telephonic connection via either a cable modem 8 or a telephone modem 10 residing in the STB. This connectivity is used to communicate orders for programming in response to a menu provided to the viewer through the TV.

In response to the programming selection, a programming signal is provided to the STB 4 via a satellite feed 12, a terrestrial feed 14, cable feed 8 (cable modem 8) or a telephonic signal through the telephone modem 10. A descrambler unit 16 in STB 4 desirables signals and grants programming access based upon the user ID contained on the smart card (SM) 18 that allows access to the programming. The descrambled signal is then routed to MPEG-2 15 for further decoding into a video and sound component and sent to TV 2 for viewing and listening.

A CPU 20 is resident in STB 4. It controls the functions of the STB 4 and supports the graphics decoded by MPG-2 15. CPU 20 also controls the input and output functions (I/O) of STB 4 including program signal reception and program ordering. It is supported by a conventional memory 22. CPU 20 also controls the descrambler 16. It first receives authorization to commence the service after first interrogating identification card 24 accessed through a conventional card reader 34.

The existing system can be made simpler by the use of a cellular network as shown in Figures 1-A, 2, 3 and 4. Figure 1-A shows a multimedia terminal without a telephone modem. It may be used in the cellular service ordering service described herein. The elimination of the telephone modem reduces the cost of the multimedia terminal 2 when orders for services are entered over a cellular network.

Referring to Figure 2, like before, the main menu for interactive service may be displayed on the TV 2 screen using a STB 4 as a source of programming signals. A startup menu is provided by a service provider 26 and is displayed on the TV 2 monitor. It can be a

teletext page or an application running on the STB 4. Typically the startup menu gives the viewer alternatives from which to choose, for instance a selection of movies.

Eliminating the telephone modem from multimedia terminal 4 as shown in Figure 1-A, will reduce its cost.

Referring to Figure 3, unlike before, programs can be selected by sending a special character code to the Service Provider 26 via the Short Message Service Center (SMSC) in a telephone network 28 by a cellular telephone 8. Each service may have a specific telephone number. Or several services may be addressed with in the same phone number when a few characters of the SM is reserved for addressing the service. In the alternative, this message may be supported and transmitted based on a Wireless Application Protocol (WAP) running on the cellular telephone circuitry 28. A specific WAP 30 can establish a unique selection of programming that can be made available such as movies.

Again referring to Figure 3, the user accesses the program service provider 26 via mobile telephone network 28 by a cellular telephone 8. After, verifying the user the program service provider 26 sends programming selections to the STB 4 for display 35 on the Monitor 2. The user inputs his program selection into cellular telephone 8 in response to prompts and the order for a program is sent over the mobile telephone network 28 to the program service provider 26 who in turn downloads the program to STB 4 for display on Monitor 2.

Referring to Figure 2, customer identification and data needed to order services such as movies are sent to the service provider 26 via SM or WAP 30 server managed by a cellular operator 33. The service provider 26 in turn sends the programming, or key to open a specific programming service to the customer's STB 4 via A Digital TV network 32 in the same message stream as the programming. Referring to Figures 1 and 1-A, every STB 4 has a specific address that is identified by a SC 18 read by a SC reader 16 in the STB 4.

Descrambler 16 may be part of a controller circuitry 36 that has a CPU 20 with input and output functions associated with it and a memory unit. Programming residing in the memory of the STB controller 36 authorizes the programming performance. In contrast SC 24 is used

for specific personal services, such as access through a bankcard. SC 18 is used for broadcast control purposes including descrambling. It is also connected to and enables the descrambler chip.

In order for a cellular phone user to order services it is necessary that the service provider 26 maintain a database to verify that the user is authorized access to the service ordered. The service provider 26 keeps track of those who have a descrambler SC 18 authorizing use of the multimedia terminal 4 as well as those who have signed up with a cellular operator to order services. When a customer wants to join the interactive TV/Cellular service he contacts the Service Provider 26. The Customer gives his identification parameter like name and cellular number and the name of the SC18 holder to the Service Provider 26. The SC 18 holder signs a contract that authorizes the specified cellular phone holder to use the services. When necessary a PIN code may be given to the customer for parental control or for general safety. The Service Provider 26 may then ask for the PIN before allowing the customer to order the service.

Finally, the Service Provider 26 adds this customer related data to his database in a table that links the SC 18 and a cellular phone together as shown in FIG. 5 by correlating the cellular telephone number to a smart card ID. When an order for services comes to the Service Provider 26 via the cellular operator's cellular network the user is identified and a database searched to correlate the user's ID with the personal identification SC 18 address or other user identification. Both the SC 18 and cellular phone number or data in a cellular phone SC must correlate with the database to authorize use of the service. Referring to Figures 1 and 1-A, the SC 24 identification will be used to charge the user.

Again referring to Figure 2, instructions to select programming and identify customers is sent to a SM or a WAP server by a cellular operator 33 via the SM or WAP server 30 to the service provider 26. The service operator 26 in turn sends the programming, or a key to open a specific programming service to the customer's STB 4 via a DVB network 32 in the same message stream as the programming. Every STB

4 has a specific address that is identified by a SC 18 read by a SC holder 16 in the STB 4. Programming residing in the STB controller 36 authorizes the programming performance.

A descrambler logic circuit and descrambling program reside within the STB 4 to descramble the programming for viewing. Several descrambling systems are commercially available. DVB has specified a common interface system for this purpose. It performs descrambling by software that typically resides on a PCMCIA type card. The DVB standard describes the interface for the multimedia terminal and CA module (common interface). Within the DVB standard descrambling system may be also embedded to STB electronics and software. In that case a separate SC is used for customers identification and to store the descrambling specific keys.

Referring to FIG. 4, one configuration is to have a wireless connection like Bluetooth between cellular phone and STB 4. RC 6 can access the STB 4 which in turn uses cellular phone 8 to dial up to the Service Provider 26 over a cellular network 28 to select programming and to transmit billing information to the service provider. The service provider responds with selected programming as before.

Video on Demand (VoD) movie service is a source of programming. A service provider sends an information page that describes all the movies that are available via the service. An information page can be transmitted via a teletext channel that is carried over analogue or digital TV service or via a data channel when digital transmission is used. As an example, the DVB standard describes the several mechanisms to deliver data packets over the transport stream. A separate application SW module can be used to present the programming information on the TV screen. Applications can also run top of a standard Application Program Interface (API) such as Open TV, MediaHighway, Multimedia Home Platform, ATVEF or any similar interface developed for digital STBs 4. A list of services and related identification info can be presented on the TV screen via a teletext system or via a TV video signal as part of a video service. In this system each movie has an identification code that

may be a number, letter or even title of the movie. The user will access this system to select the menu page using a RC 6.

After the customer decides which movie or service to order a SM or data message is sent based on WAP with his cellular telephone 8 to the service provider. The customer identification is based on the customer's telephone card that may be a SC with an embedded memory chip holding the customer's identification data. The customer is billed for programming selected by either the cellular service operator 33 or the service provider 26. Charges for the service are based on time or event.

The service provider then transmits the ordered movie or service and authorization information via a scrambled broadcast channel to the customer. Scrambling and descrambling is based on standard procedures used by digital TV systems such as used in DVB.

The customer uses the RC 6 to select the service that may be a broadcast channel or multiplex, from his TV 2 or STB 4. The descrambling of the programming signal is performed in the STB 4 and controlled by a SC 18 used to identify the customer and authorize the selected service based upon the authorized information received via the broadcast channel.

There is yet another way to build a cellular based system for ordering TV delivered programming based on Near Video on Demand (NVoD). NVoD is in use in Europe and is quite popular. In this system movies are constantly running. The customer selects the desired movie and only the authorization to purchase the movie is sent over the broadcast channel. Part of the broadcast channel is reserved for data applications in digital broadcast systems. The receiving unit in the STB descrambles the selected movie. Billing is handled as with the VoD service.

Another way to access the VoD and NVoD service using a cellular network is to use a specific cellular terminal capable to run an application to order service. This kind of cellular terminal could be a WAP type telephone. An application may be downloaded to the cellular terminal displaying the movie titles on the cellular phone screen. The customer may

scroll through the movies and select one. Authorization of the movies can be done in the ways previously described. There is not need to display a menu on the TV monitor of the movies available for selection.

Other services may be ordered using the above systems such as electronic shopping services, simple banking transactions, purchasing event tickets, ordering music such as MP3 format to be loaded onto the cellular terminal memory or a hard drive.

When a cellular telephone and an STB 4 include a Bluetooth connection any service may be ordered via the cellular/STB combination with a cellular telephone. A cellular telephone menu is presented from which service is selected and initialized. The cellular telephone first downloads the specific SW application to the STB and controls it with a Bluetooth connection. A separate RC 6 is not needed to select any elements of the service.

General Packet Radio Service (GPRS) is being developed that will run parallel to GSM systems. Its data transmission speed is up to 100kps. The increase speed greatly increases capacity to minimize system overload. It also extends an Internet connection to a mobile PC without accessing a separate ISP. It is a cost efficient system allowing constant connectivity. It will support a cellular connection to a service provider in a fixed and mobile environment thereby allowing viewing of selected programming using the afore-described systems on a mobile TV accessed through a STB.

Other variations of this invention may be used and are not disclaimed by not being disclosed herein.

CLAIMS

1. A system for ordering programming for performing comprising:
 - a viewing monitor to display programming,
 - a set top box electronically connected to said monitor to provide programming signals to said monitor,
 - a display of programming selections,
 - an input device to said set top box to display programming selections,
 - a mobile telephony network,
 - a communications link from said mobile telephony network to said source of programming signals, and
 - a mobile telephony device to access said mobile telephony network to select programming.
2. A system for ordering programming for performing as claimed in claim 1 further comprising a cellular telephony device associated with said set top box for accessing said source of programming signals to order programming.
3. A system for ordering programming for performing as claimed in claim 2 further comprising a remote control to access said set top box to initiate said cellular telephony device to order programming.
4. A system for ordering programming for performing comprising:
 - means for displaying programming,
 - means for connecting said programming display to a program service provider,
 - means for providing a mobile communications connection to said program service provider, and means for selecting programming from said program service provider over said mobile communication connection.
5. A system for ordering programming for performing as claimed in claim 4 further comprising a means for displaying program selection.

6. A method for ordering programming for performing having the steps of:
displaying a menu of programming on a monitor,
using a mobile telephony device to access a mobile communications network,
and
accessing a service provider through said mobile communications network to
select programming for viewing on said monitor,
7. The method of claim 6 having the further step of displaying said programming.
8. The method of claim 6 having the further step of verifying user authorization
to view programming.
9. A system for ordering programming for performing comprising:
a viewing monitor to display programming,
a set top box electronically connected to said monitor to provide programming
signals to said monitor, said set top box having a cellular calling device for
connection to a cellular communications network,
a display of programming selections,
an input device to said set top box to display programming selections,
a mobile telephony network,
a communications link from said mobile telephony network to said source of
programming signals, and
a remote control to access said set top box to activate said cellular calling device
to select programming from said programming source.

FIG. 1

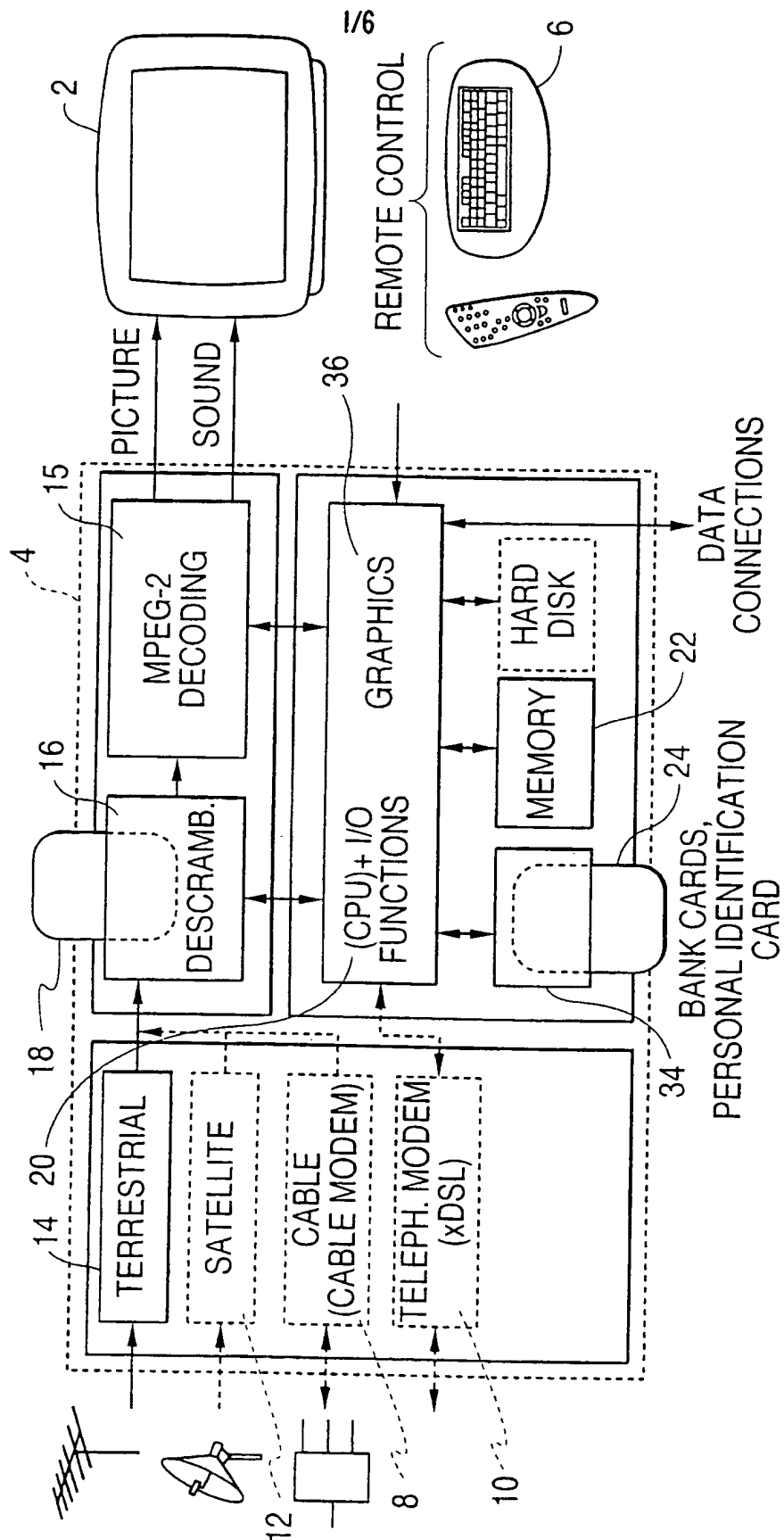
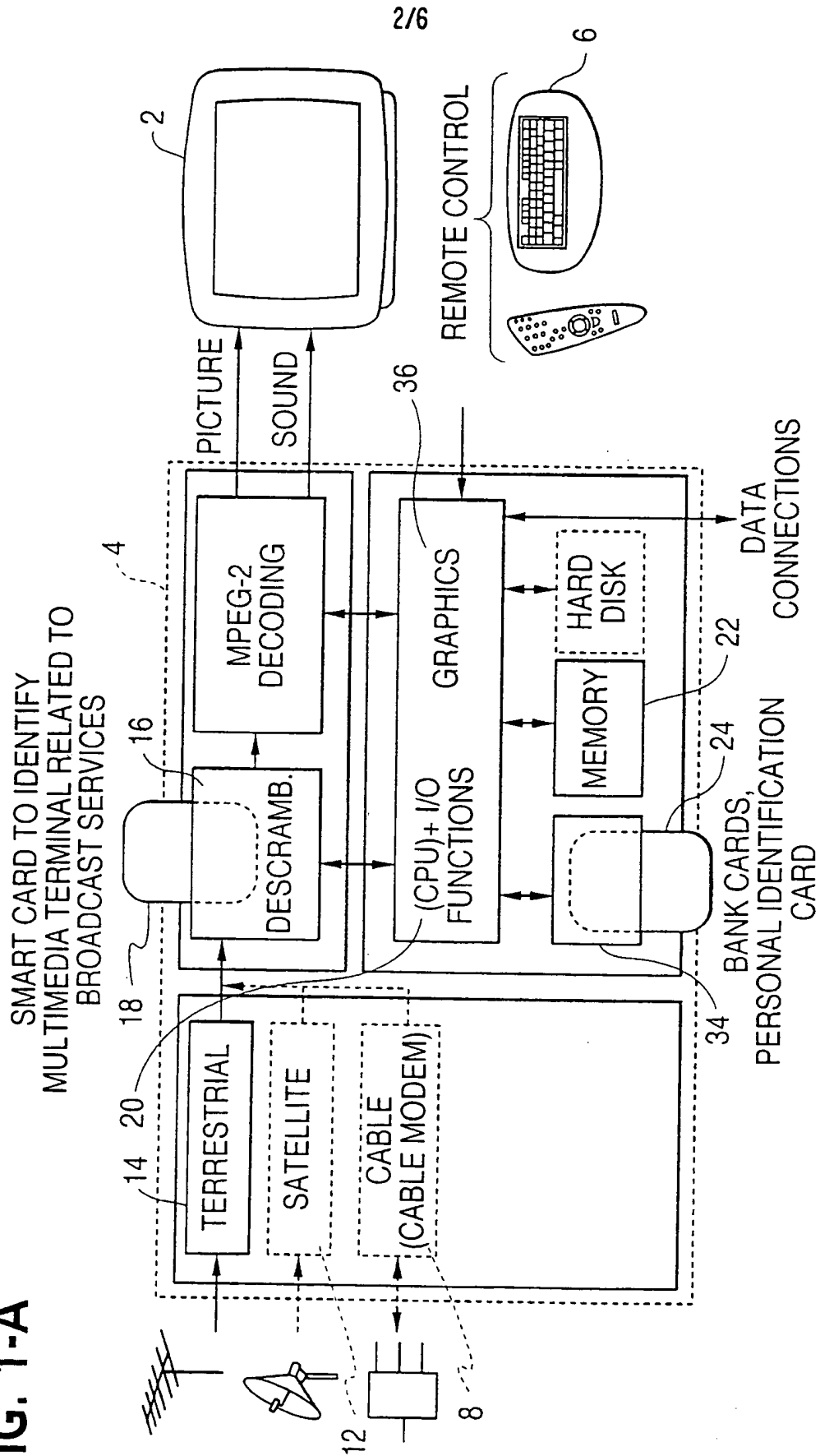


FIG. 1-A



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FIG. 2

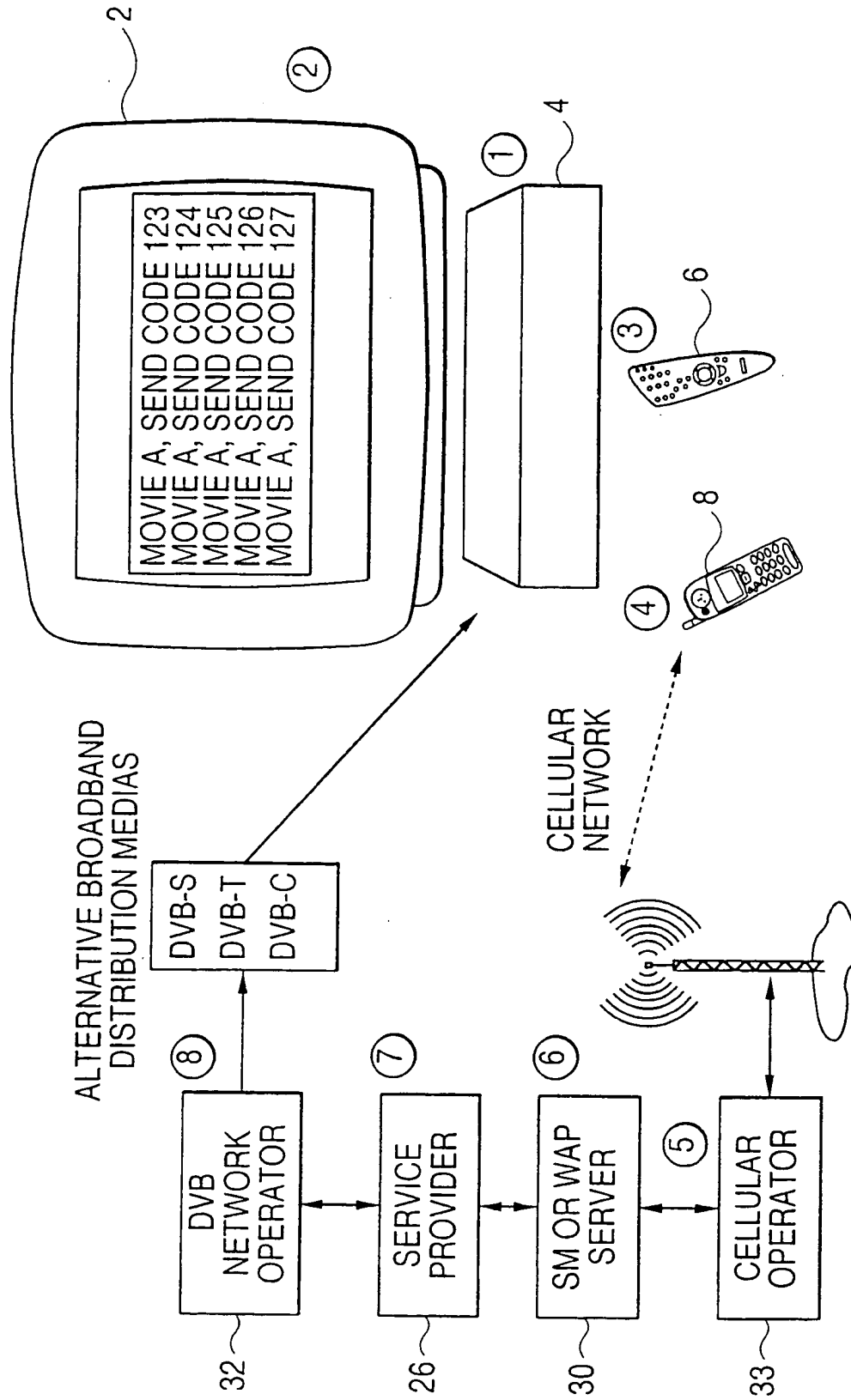
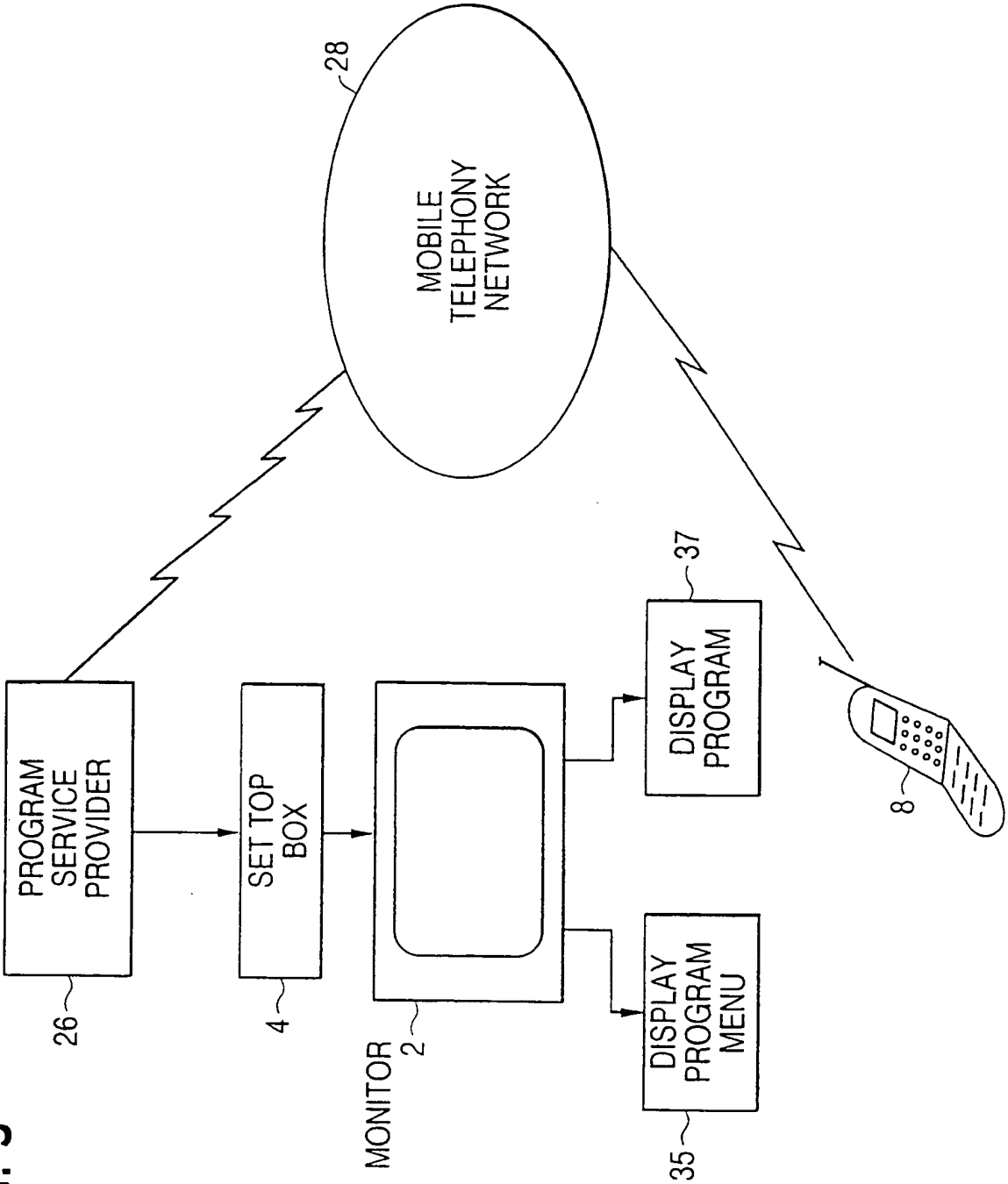


FIG. 3



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FIG. 4

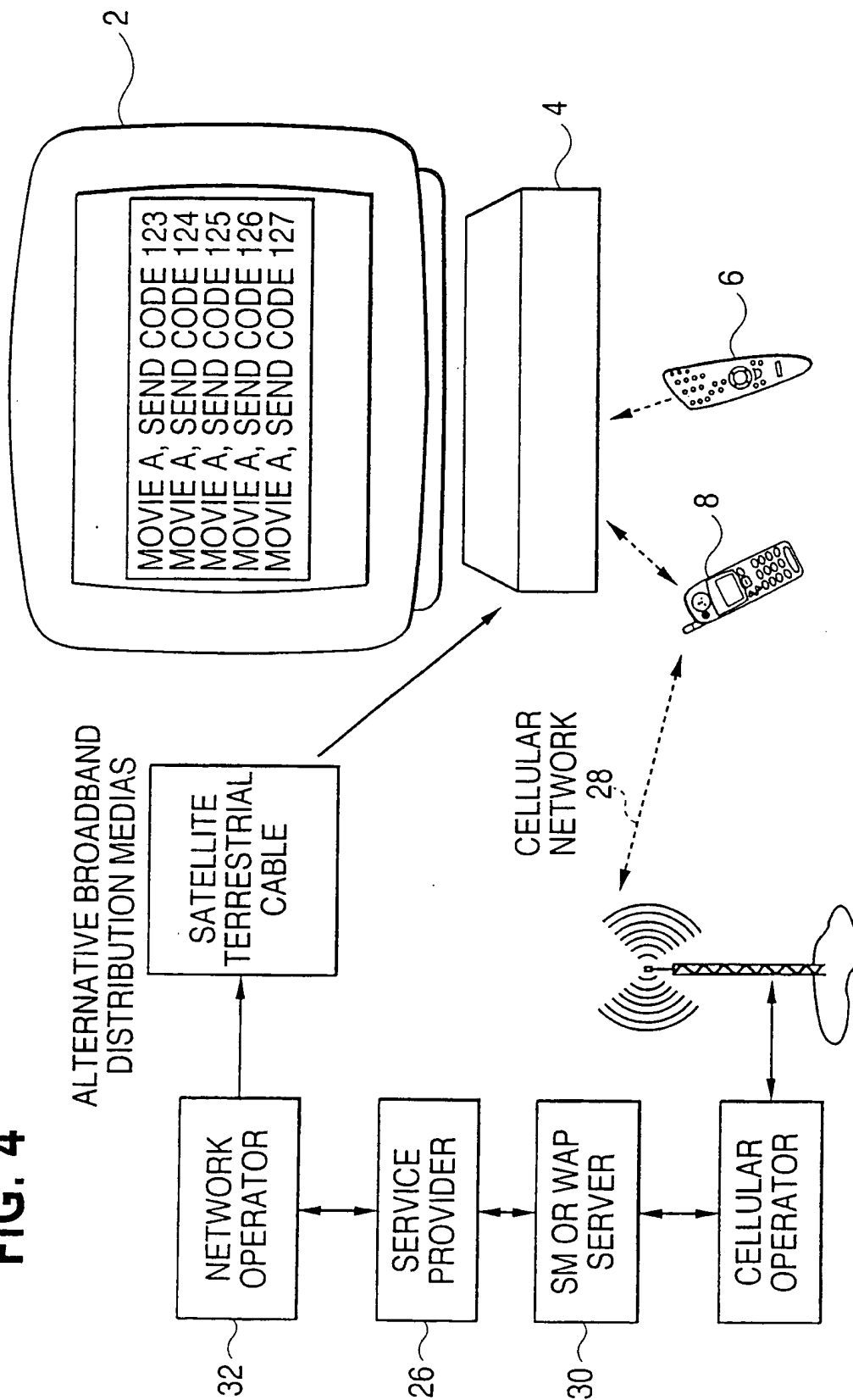


FIG. 5

BROADCAST CUSTOMERS		CELLULAR CONNECTIONS	
NAME	SMART CARD ID	NAME	CELLULAR NUMBER
SMITH ARNOLD	1234469	SMITH ARNOLD	2345565222
SMITH GARRY	2389011	SMITH HELEN	2346689033
...	1234909
...
SMITH JOAN	1267539	JOHNSON KIM	2358877634
SMITH STEVEN	1238764	MATSON BOB...	3347835732...
...
...

INTERNATIONAL SEARCH REPORT

In. tional Application No

PCT/IB 00/01694

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 H04N7/173 H04N5/445

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 99 04568 A (RADIOSCAPE) 28 January 1999 (1999-01-28) page 9, line 16 - line 20 page 1, line 8 - line 11 ---	1,4,6,9
A	WO 98 43426 A (CANAL+) 1 October 1998 (1998-10-01) abstract page 11, line 26 -page 12, line 2 page 4, line 25 -page 5, line 1 ---	1,4,6,9
A	WO 99 57905 A (SCIENTIFIC ATLANTA) 11 November 1999 (1999-11-11) abstract page 7, line 3 - line 6 ---	1,4,6,9
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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

2 February 2001

Date of mailing of the international search report

08/02/2001

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INTERNATIONAL SEARCH REPORT

In. tional Application No

PCT/IB 00/01694

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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A	DE 196 49 069 A (THOMSON BRANDT GMBH) 4 June 1998 (1998-06-04) abstract column 1, line 1 - line 21 -----	1,4,6,9

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Information on patent family members

International Application No

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